

REMARKS

This Amendment is submitted in response to the outstanding Office Action dated December 29, 2003 wherein the Examiner rejected claims 1-20. Claims 1,2, 4-6, 8-10, 12-14, 17 and 18 were rejected as being anticipated by de Haan et. al "True Motion Estimation with 3-D Recursive Search Block Matching" (hereinafter "de Haan"). The Examiner further rejected claims 3, 7, 11, 15, 16, 19 and 20 under 35 U.S.C 103a as being unpatentable over de Haan. Reconsideration of these rejections in view of the following remarks is respectfully requested.

The rejection under 35 U.S.C. Section 102

In the January 14, 2004 Office Action, the Examiner rejected claims 1-4, 7-13, 16-19 and 22-25 under 35 U.S.C. Section 102(e) as being anticipated by United States Patent No. 5,990,927 to *de Haan*. The Applicant respectfully traverses this rejection on the grounds that de Haan does not teach or suggest an "**enhancement** vector of enhancement algorithms" but rather only motion vectors.

It is axiomatic that a prior art reference anticipates the claimed invention under 35 U.S.C. Section 102 only if every element of a claimed invention is identically shown in that single reference, arranged as they are in the claims. MPEP Section 2131.

See, In re King, 231 USPQ 126, 138 (Fed. Cir. 1986) citing with approval, *Lindemann Maschinenfabrik v. American Hoist and Derrick*,

221 USPQ 481, 485 (Fed. Cir. 1984)); In re Bond, 910 F.2d 831, 832, 15 USPQ2d 1566, 1567 (Fed. Cir. 1990). Anticipation is only shown where each and every limitation of the claimed invention is found in a single prior art reference. MPEP Section 2131. In re Donohue, 766 F.2d 531, 534, 226 USPQ 619, 621 (Fed. Cir. 1985).

With respect to any of Claims 1, 2, 4-6, 8-10, 12-14, 17 and 18, a determination of anticipation in accordance with Section 102 requires that each feature claimed therein be described in sufficient detail in de Haan to enable one of ordinary skill in the art to make and practice the claimed invention.

The Applicant directs the Examiner's attention to Claim 1 of the application, which contains the following unique and novel limitations:

1. A receiver including, a video enhancement mechanism for enhancing video information with spatio-temporal consistency, comprising:
 - at least one enhancement unit enhancing a characteristic other than position of a selected pixel region of video information utilizing at least one candidate **enhancement vector of enhancement algorithms** to generate an enhanced pixel region for each candidate enhancement vector, each said enhanced pixel region equivalent to enhancement of said selected pixel region utilizing a respective candidate enhancement vector of enhancement algorithms; and
 - a selection unit computing an error for each said enhanced pixel region utilizing a bias towards spatio-temporal consistency of a respective enhanced pixel region with spatially adjacent pixel regions in a picture containing said selected pixel region and with a counterpart pixel region in one or more pictures successive with said picture containing said selected pixel region, said selection unit selecting an enhanced pixel region having a best enhancement for spatio-temporal consistency.

The Applicant respectfully asserts that the above-emphasized limitations are not shown in the de Haan reference. The cited portions of the de Haan reference do not recite **enhancement vectors**. In the most recent Office Action The Examiner stated that the

"spatial and temporal predictions of de Haan (see sections II and IV) involve motion estimation through the use of block matchings where the minimum summed absolute differences between blocks are calculated to select the best candidate block (i.e., with a corresponding best candidate vector in the best displacement offset, see second sentence of Section IV of de Haan). And by providing the best candidate block through the minimum SAD calculations, de Haan is providing the best estimated block image and as such it is submitted again that de Haan provides the same enhancement unit (i.e., estimators (a and b), see Section IV) enhancing a characteristic other than position of a selected pixel region of video information utilizing at least one candidate enhancement vector of enhancement algorithms to generate an enhanced pixel region for each candidate enhancement vector, as claimed. It is further noted that de Haan is interested in providing smoothness of images through spatial and temporal predictions by adding penalties to the error functions involved in block matching (see Section VI, pages 372-373). By smoothing the images, de Haan provides the same enhanced pixel region equivalent to enhancement of the selected pixel region utilizing a respective candidate enhancement vector of enhancement algorithms as claimed."

Applicant takes this opportunity to distinguish Applicant's invention from the cited portions of de Haan. In the paper of Gerard de Haan et al., he describes the motion estimation process of the 3D-RS motion estimator. Although the 3D-RS uses candidate vectors, these are candidate **motion** vectors. These candidate vectors are used to find the best correlation between a set of pixels (i.e. a block) in the current image and a corresponding set in the previous image. So, the vectors have nothing to do with

enhancement as defined in Applicant's specification. These vectors just define the relation between the subsequent pictures with respect to motion, on a block basis. As a metric, the sum-of-absolute differences is used to determine the best vector. The motion estimator is **not** enhancing anything; it just defines a relation between pictures!

In Applicant's invention, the candidate vectors are **enhancement** vectors. They do not describe any relation between the subsequent pictures (like the motion vectors do), but contain coefficients for enhancement of the current picture (which is not the case with motion vectors). As described in the preferred embodiment, a metric, an 'objective quality metric' can be used to determine the best vector, i.e. coefficients for enhancement. A spatio-temporal model, like in 3D-RS ME, is used to provide spatio-temporal consistency in the *decision* of the best vector. The best vector describes how to **enhance** the pixels in the corresponding block. It does not describe any relation with the subsequent pictures.

Accordingly, Applicants respectfully submit that since de Haan is referring to motion vectors whereas Applicant's claims are directed to enhancement vectors including enhancement algorithms, the claims are allowable over de Haan. Applicant respectfully submits that these claims are in condition for allowance. Allowance of these claims is respectfully requested.

The rejection under 35 USC Section 103

The Examiner rejected claims 3, 7, 11, 15, 16, 19 and 20 under 35 U.S.C. Section 103(a) as being unpatentable over de Haan. The Applicant respectfully traverses the Examiner's assertion that the Applicant's invention is obvious in view of the de Haan reference.

The Applicant respectfully requests the Examiner to withdraw the rejection of Claims 3, 7, 11, 15, 16, 19 and 20 in view of Applicant's arguments.

During *ex parte* examinations of patent applications, the Patent Office bears the burden of establishing a *prima facie* case of obviousness. MPEP Section 2142; *In re Fritch*, 972 F.2d 1260, 1262, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992). The initial burden of establishing a *prima facie* basis is to deny patentability to a claimed invention is always upon the Patent Office. MPEP Section 2142; *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992); *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984). Only when a *prima facie* case of obviousness is established does the burden shift to the applicant to produce evidence of non-obviousness. MPEP Section 2142; *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992); *In re Grabiak*, 769 F.2d 729, 733, 226 USPQ 870, 873 (Fed. Cir. 1985).

A *prima facie* case of obviousness is established when the teachings of the prior art itself suggest the claimed subject matter to a person of ordinary skill in the art. *In re Bell*, 991

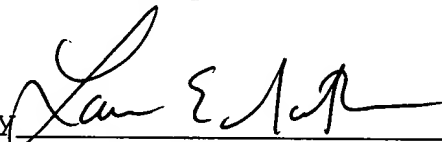
F.2d 781, 783, 26 USPQ2d 1529, 1531 (Fed. Cir. 1993). To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed invention and the reasonable expectation of success must both be found in the prior art, and not be based on an applicant's disclosure. MPEP Section 2142.

With respect to Claims 3, 7, 11, 15, 16, 19 and 20, the Applicant notes that these claims depend directly or indirectly from independent claims 1, 5, 9, 13 and 17. As previously described, independent Claims 1, 5, 9, 13 and 17 contain unique and novel claim limitations of the Applicant's invention not shown in the de Haan reference. Thus, Claims 3, 7, 11, 15, 16, 19 and 20 also contain the same unique and novel claim limitations of independent Claims 1, 5, 9, 13 and 17. The Applicant respectfully submits that the Patent Office has not established a *prima facie* case of obviousness with respect to Claims 3, 7, 11, 15, 16, 19 and 20 of the Applicant's invention, and that the rejection of the claims under 35 U.S.C. Section 103(a) has thus been overcome.

The Applicant respectfully submits that Claims 3, 7, 11, 15, 16, 19 and 20 are in condition for allowance. Allowance of these claims is respectfully requested.

If any issues arise, or if the Examiner has any suggestion for expediting allowance of this Application, the Applicants respectfully invite the Examiner to contact the undersigned at the telephone number indicated below or at Laurie.Gathman@Philips.com.

Respectfully submitted,

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On Feb. 10, 2004

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